

**Notice of Allowability**

Application No.

09/828,188

Examiner

Esaw T Abraham

Applicant(s)

PATERSON, KENNETH GRAHAM

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address--

All claims being allowable, PROSECUTION ON THE MERITS IS (OR REMAINS) CLOSED in this application. If not included herewith (or previously mailed), a Notice of Allowance (PTOL-85) or other appropriate communication will be mailed in due course. **THIS NOTICE OF ALLOWABILITY IS NOT A GRANT OF PATENT RIGHTS.** This application is subject to withdrawal from issue at the initiative of the Office or upon petition by the applicant. See 37 CFR 1.313 and MPEP 1308.

1. ☒ This communication is responsive to 05/04/07.
2. ☒ The allowed claim(s) is/are 32-46 (renumbered as 1-15).
3. ☒ The drawings filed on 04/09/01 and 05/04/07 (fig. 8) are accepted by the Examiner.
4. ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
  - a) ☐ All    b) ☐ Some\*    c) ☐ None    of the:
  1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this national stage application from the International Bureau (PCT Rule 17.2(a)).

\* Certified copies not received: \_\_\_\_\_

Applicant has THREE MONTHS FROM THE "MAILING DATE" of this communication to file a reply complying with the requirements noted below. Failure to timely comply will result in ABANDONMENT of this application.

**THIS THREE-MONTH PERIOD IS NOT EXTENDABLE.**

5. ☐ A SUBSTITUTE OATH OR DECLARATION must be submitted. Note the attached EXAMINER'S AMENDMENT or NOTICE OF INFORMAL PATENT APPLICATION (PTO-152) which gives reason(s) why the oath or declaration is deficient.
  6. ☐ CORRECTED DRAWINGS (as "replacement sheets") must be submitted.
    - (a) ☐ including changes required by the Notice of Draftsperson's Patent Drawing Review (PTO-948) attached
      - 1) ☐ hereto or 2) ☐ to Paper No./Mail Date \_\_\_\_\_.
    - (b) ☐ including changes required by the attached Examiner's Amendment / Comment or in the Office action of Paper No./Mail Date \_\_\_\_\_.
- Identifying indicia such as the application number (see 37 CFR 1.84(c)) should be written on the drawings in the front (not the back) of each sheet. Replacement sheet(s) should be labeled as such in the header according to 37 CFR 1.121(d).
7. ☐ DEPOSIT OF and/or INFORMATION about the deposit of BIOLOGICAL MATERIAL must be submitted. Note the attached Examiner's comment regarding REQUIREMENT FOR THE DEPOSIT OF BIOLOGICAL MATERIAL.

**Attachment(s)**

1. ☐ Notice of References Cited (PTO-892)
2. ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3. ☐ Information Disclosure Statements (PTO-1449 or PTO/SB/08),  
Paper No./Mail Date \_\_\_\_\_
4. ☐ Examiner's Comment Regarding Requirement for Deposit  
of Biological Material
5. ☐ Notice of Informal Patent Application (PTO-152)
6. ☐ Interview Summary (PTO-413),  
Paper No./Mail Date \_\_\_\_\_
7. ☐ Examiner's Amendment/Comment
8. ☒ Examiner's Statement of Reasons for Allowance
9. ☐ Other \_\_\_\_\_

*Esaw T. Abraham*  
Primary Examiner

### DETAILED ACTION

1. The amended or substituted specification and drawing received on 05/12/04 are accepted by the examiner.

#### *Examiner's statement for reason for allowance*

The following is an examiner's statement for allowance:

2. Claims **32-46** have been allowed.

As per claim **32**, the prior art, Tenengolts (U.S. PN: 4,782,490) teaches a method and system for error detection and correction in which codewords are made up of data and two groups of check symbols. The first group of check symbols is generated by a correction verification code, which verifies error correction; and, the second group of check symbols is generated by an interleaved Reed-Solomon code with symbols from the Galois field  $GF(2^8)$ , which serves for error correction and the correction verification code is cyclic with a generator polynomial over the  $GF(2^8)$ . Further, Lee et al. (U.S. PN: 5,872,799) teach a check symbols that represent redundant information about the code word and used to provide error correction and detection capabilities and the check symbols are the coefficients of the remainder polynomial generated by dividing the order of polynomial by an order of "generator polynomial" over a Galois field (see col. 1, lines 46-65 and abstract). **However**, the prior art taken singly or in combination fail to teach a magnetic tape comprising a magnetic tape comprising multiple parallel diagonal tracks together storing N data bytes divided into M sub groups, each sub groups having data bytes and orthogonal redundancy coding bytes and error correcting sub groups resulting from M sub groups; each of the sub groups having P bytes; each pair of the parallel diagonal tracks together including one of the sub groups so that a first track of each diagonal

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truck pair includes  $P/2$  bytes of sub group I and a second track of each diagonal track pair include the remaining  $P/2$  bytes of sub group  $I = 1 \dots M$ ; the error correcting sub group being additional pair of the parallel diagonal trucks A and B; the bytes in tracks A and B having values resulting from byte k of the  $2M$  tracks being combined; track j including a pair of further check bytes derived in accordance with the polynomial where,  $\alpha$  is a primitive element  $GF()$ ,  $X =$  the value of the byte k of track j,  $j = 1 \dots 2M$ , A, B and  $k = 1 \dots P/2$ . Consequently, claim 32 is allowed over the prior art.

Claims 33 and 34, which are directly or indirectly dependents of claim 32 are also allowable over the prior art of record.

As per claim 35, the prior art, Tenengolts (U.S. PN: 4,782,490) teaches a method and system for error detection and correction in which codewords are made up of data and two groups of check symbols. The first group of check symbols is generated by a correction verification code, which verifies error correction; and, the second group of check symbols is generated by an interleaved Reed-Solomon code with symbols from the Galois field  $GF(2^8)$ , which serves for error correction and the correction verification code is cyclic with a generator polynomial over the  $GF(2^8)$ . Further, Lee et al. (U.S. PN: 5,872,799) teach a check symbols that represent redundant information about the code word and used to provide error correction and detection capabilities and the check symbols are the coefficients of the remainder polynomial generated by dividing the order of polynomial by an order of "generator polynomial" over a Galois field (see col. 1, lines 46-65 and abstract). **However**, the prior art taken singly or in combination fail to teach a method of reading bytes stored in diagonal tracks, the tracks including  $2M$  tracks each storing data bytes and orthogonal redundancy coding bytes, and tracks

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A, B each storing error correction bytes coded with RS error correcting code comprising reading the bytes from the 2M, A, B tracks; and performing a check sum calculation on the bytes; wherein the check sum calculation includes processing the bytes in track  $j$  in accordance with the polynomial where  $j = 1 \dots 2M, A, B$ ,  $\alpha$  is a primitive element  $GF()$ ,  $X$  = the value of byte  $k$  in track  $j$ ,  $j = 1 \dots 2M, A, B$ , and  $k = 1 \dots Q$ ,  $Q$  = number of bytes in track  $j$ . Consequently, claim 35 is allowed over the prior art.

Claims 36, 37, and 41-43, which are directly or indirectly dependents of claim 35 are also allowable over the prior art of record.

As per claim 38, the prior art Tenengolts (U.S. PN: 4,782,490) teaches a method and system for error detection and correction in which codewords are made up of data and two groups of check symbols. The first group of check symbols is generated by a correction verification code, which verifies error correction; and, the second group of check symbols is generated by an interleaved RS code with symbols from the Galois field  $GF(2^8)$ , which serves for error correction and the correction verification code is cyclic with a generator polynomial over the  $GF(2^8)$ . Further, Lee et al. (U.S. PN: 5,872,799) teach a check symbols that represent redundant information about the code word and used to provide error correction and detection capabilities and the check symbols are the coefficients of the remainder polynomial generated by dividing the order of polynomial by an order of "generator polynomial" over a Galois field (see col. 1, lines 46-65 and abstract). **However**, the prior art taken singly or in combination fail to teach a method of writing data and error correcting bytes into multiple parallel diagonal tracks, the method comprising dividing  $N$  data bytes into  $M$  sub groups, each sub groups having data bytes and orthogonal redundancy coding bytes and error correcting sub groups resulting from  $M$

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sub groups; each of the sub groups having  $P$  bytes; each pair of the parallel diagonal tracks together including one of the sub groups so that a first track of each diagonal track pair includes  $P/2$  bytes of sub group  $I$  and a second track of each diagonal track pair include the remaining  $P/2$  bytes of sub group  $I = 1 \dots M$ ; the error correcting sub group being additional pair of the parallel diagonal tracks  $A$  and  $B$ ; the bytes in tracks  $A$  and  $B$  having values resulting from byte  $k$  of the  $2M$  tracks being combined; track  $j$  including a pair of further check bytes derived in accordance with the polynomial where,  $\alpha$  is a primitive element  $GF()$ ,  $X$  = the value of the byte  $k$  of track  $j$ ,  $j = 1 \dots 2M$ ,  $A$ ,  $B$  and  $k = 1 \dots P/2$ . Consequently, claim 38 is allowed over the prior art.

Claims 39, 40, and 44-46, which are directly or indirectly dependents of claim 38 are also allowable over the prior art of record.

Any comments considered necessary by applicant must be submitted no later than the payment of the issue fee and, to avoid processing delays, should preferably accompany the issue fee. Such submissions should be clearly labeled "Comments on Statement of Reasons for Allowance."

#### *Conclusion*

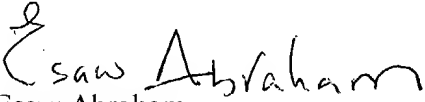
4. Any inquiry concerning this communication or earlier communication from the examiner should be directed to Esaw Abraham whose telephone number is (703) 305-7743. The examiner can normally be reached on M-F 8-5.

If attempts to reach the examiner by telephone are successful, the examiner's supervisor, Albert DeCady can be reached on (703) 305-9595. The fax phone numbers for the organization where this application or proceeding is assigned are (703) 746-7239 for regular communications and (703) 746-7238 for after final communications.


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Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 305-3900.

  
Esaw Abraham

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Primary Examiner